ATTACHMENT A
Remarks

Claims 1-20 stand pending in the present application. By this Amendment, Applicant has amended claims 1 and 5 and added new claims 15-20. Applicant respectfully submits that the present application is in condition for allowance based on the discussion which follows.

Claims 1, 2, 6 and 8-14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,164,956 to Lang (hereinafter "Lang") and claims 3-5 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lang further in view of U.S. Patent No. 6,072,926 to Cole et al (hereinafter "Cole").

With regard to Lang, the Examiner alleges that Lang discloses a grating structure with a first order grating superimposed with a second order grating. However, the Examiner does admit that Lang fails to disclose a grating structure being composed of material having an index of refraction variation. The Examiner infers from Figure 3c (Lang) that Lang discloses another grating composed of a graded index layer (GRIN layer) which by definition is a layer with a refractive index variation. Then, the Examiner alleges it would have been obvious to modify its first and second order grating structure to be composed of a material with a refractive index variation.

With regard to claims 6, 8, 11, 13 and 14, the Examiner notes that Lang fails to disclose the grating used in a filter, coupler sensor or dispersion compensating device. However, the Examiner alleges that Lang discloses the use of its grating as a source of optical interconnects or to coupled light. The Examiner then makes the assumption that it would have been obvious at the time of the invention to use the grating of Lang in a filter, coupler sensor or dispersion compensating device.

Contrary to the Examiner's allegations, the present invention comprising an optical waveguide having a grating structure comprising a first grating structure and a second grating structure of different orders is not anticipated nor made obvious from Lang. In an effort to more clearly and specifically describe the present grating structure, claim 1 has been amended which specifically defines the first and second grating structures.

In order to more fully appreciate the distinctions between the present optical waveguide and that of the prior art including Lang, it is helpful to understand the context in which the present invention exists and contrast that with Lang. Lang discloses a surface with a grating built using etched semi-conductor materials, which is used to couple light out of a surface emitting laser. In contrast to Lang, the present grating is built using UV written optical wavelight guides. These two technologies are completely distinct and bear no relation to each other.

As correctly noted by the Examiner, "Lang fails to disclose the grating structure to be composed of a material having an index of refraction variation" (Office Action, page 2). Although the Examiner attempts to imply that Figure 3c depicts a structure composed of a grading index layer, this is not the case. Referring to Figure 3c (Lang), and to column 4, lines 43-53 (which admittedly refer to Figure 2c not 3c but the two figures are analogous), it is clear that the GRIN layers 15 and 16 are on either side of the active layer 12 which together form the active area between the passive cladding layers 13 and 14. Lines 53-54 state that "a grating layer...is grown over the upper GRIN layer". Thus, the grating structure is <u>not</u> composed of a grading index layer as alleged by the Examiner. On the contrary, it is a completely different portion of the

device which is formed from a graded refractive index layer. In fact, in Lang, the GRIN forms part of the active area the surface emitting laser but does not form part of the etched grating.

It is completely erroneous to allege that because one part of a device could be formed from a graded refractive index material that it would be obvious to form a completely different part of that device from the material having a refractive index variation. Therefore, the allegation that it would be obvious to modify Lang to make a superimposed grating structure having an index of refraction variation is completely illogical. Alternatively, such an argument is purely hindsight as Lang provides absolutely no teaching, suggestion or motivation to modify one part to include the characteristics (i.e., a graded index layer) of another part.

With regard to the rejection of claims 6, 8, 11, 13 and 14, contrary to the Examiner's allegation, it would not have been obvious to one of ordinary skill in the art to use the present grating device in a filter, coupler sensor or dispersion compensating device based on the disclosure of Lang. Specifically addressing the alleged obviousness use as a filter, as discussed above, the graded refractive index portion of Lang is not part of the grating structure. Further, there is no suggestion or motivation disclosed in Lang as to why or how the device of Lang might be modified to provide an optical filter. Thus, Lang provides no suggestion, motivation or an enabling disclosure as to how one would modify Lang to be applicable for use as a filter.

With regard to the Examiner's allegation that Lang makes obvious the present free space coupler and sensor, although Lang can be used for coupling light out of a SEL, the Lang device is completely unsuitable for coupling light into a device.

Therefore, Lang fails to be suitable and therefore fails to teach or suggest the use of a free space coupler or optical sensor which require coupling of light into and out of an optical waveguide in a direction perpendicular to the core of the waveguide. Therefore, a free space coupler and an optical sensor would not have been obvious from the teaching of Lang.

With respect to the implementation of the present invention as a dispersion compensator, none of the presently known methods utilize a loss mechanism as claimed.

Based on the foregoing discussion, Applicant respectfully submits that claims 1-14 are not obvious from Lang individually or in combination with Cole and therefore, Applicant respectfully requests that the rejection to the claims under 35 U.S.C. § 103(a) be withdrawn.

By this Amendment, Applicant has added new device claims 15-18 and new method claims 19 and 20. New claims 15-20 are appropriate for inclusion with the present application as the subject matter was previously disclosed in the application as filed and thus, not new matter. Further, all pending claims represent a single general inventive concept and thus present unity of invention in accordance with PCT Rules 13.1 and 13.2 as implemented under 37 C.F.R. § 1.475(b)(3) which states that claims to different categories of invention will be considered to have unity of invention if the claims are drawn to a product and a method of using that product. In the present application, claims 1-18 represent product (device) claims and claims 19 and 20 represent a method of using that device. Thus, all claims share the same inventive concept, i.e., an optical filter comprising an optical waveguide having a refractive index

variation and comprising a first grating structure and a second grating structure of different orders, and therefore, there is unity of invention among all claims.

Applicant further respectfully submits that new independent claims 15-18 are clear of the prior art as discussed above with regard to the rejection of claims 1-14. Further, new claims 15-18 relate specifically to an optical filter, a free space coupler, an optical sensor and a dispersion compensator in which these devices represent new grating structures in which superimposition would not have been obvious from the teaching of Lang. All of these devices are completely different from the device of Lang. For example, with regard to the dispersion compensator of claims 18 and 20, no previously known methods or devices utilize a loss mechanism as claimed.

Further, it would not be possible to modify the device of Lang due to the manufacture process utilized in its creation. The etching process used to create grating suitable for a surface emitting laser as in Lang is completely unrelated to the UV fabrication of a grating made for the variations in refractive index. The device of the present invention uses passive effects induced by variegated index whereas the device of Lang is active and requires a service emitting laser to work. Thus, it directly follows that the range of applications of the present device is much wider than that of Lang. Based on the foregoing, Applicant respectfully submits that new claims 15-20 are clear of the prior art of record.

In view of the foregoing, Applicant respectfully submits that the present application is in condition for allowance.

END REMARKS